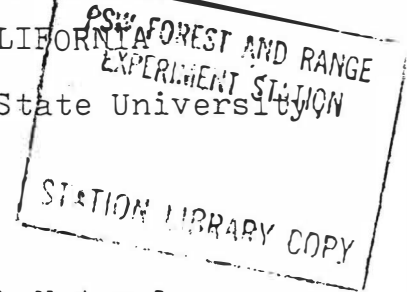


AN ECOLOGICAL SURVEY OF THE NORTH TRINITY MOUNTAIN ~~CANDIDATE~~
RESEARCH NATURAL AREA, HUMBOLDT COUNTY, CALIFORNIA

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The proposed North Trinity Mountain Research Natural Area is on the Lower Trinity Ranger District, Six Rivers National Forest. This RNA is nominated to represent the White Fir Type (SAF 211) (Eyre 1980). The area of about 640 acres includes the slopes drained by the south fork of Mill Creek. It is located in Sections 32 and 33, T.9N. R.6E. and Sections 3, 4, and 5, T.8N. R.6E., about 16 miles east of Hoopa via Big Hill Road and Forest Road 10N02 (Fig. 1). One access to the area is by the ridge on the north where an old road to Mill Creek Lakes can now be walked. Another trail, used by ORV's, gives access to Mill Creek Lake from the road to Grogan Hole. This southerly access is easiest, especially to the upper part of the RNA.

The general topography is one of gentle to steep slopes descending directly to streams. Terraces are minor, especially at lower elevations. Slopes in the lower, western portion are more abrupt. I am taking the study area to include the meadows of Red Cap Hole and slopes to North Trinity Mountain, but not Mill Creek Lakes. The map of the Research Natural Area Proposal Sample Format (Burke 1977) and map appended to the field reconnaissance by Ward and Horton (1978)

a. Field assistance by Michael Ericksen and Dale Thornburgh.

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differ in many details, especially in shape of the area. I included areas west of the Ward and Horton boundary that are not included in the Colgrove Timber Sale. Elevations in the resulting study area range from 4500-6362 ft.

The study area is underlain by quartz diorite of the Ironside Mountain batholith. This extensive terrain runs from Hayfork in the south to Orleans Mountain in the north. This band of granitic rock separates two subprovinces of the Klamath Region, the Western Jurassic belt and the Western Paleozoic and Triassic belt (Irwin 1966).

Details of the topography of the study area are primarily the result of glacial action. Mill Creek Lake is the result of a moraine dam, and the slopes behind the lake are scoured. Drift represents a major parent material of the proposed RNA. Some part of the study area may have soils developed from bedrock as the glacial action was localized in the area.

The study area is adjacent to the Orleans quadrangle which has been soil-vegetation surveyed (Rocky et al. 1966). There, parts with comparable elevation and topography have soils mapped as Chawanakee and Chiquito series. The Chawanakee series is a member of the loamy, mixed, mesic, shallow family of Dystric Xerochrepts (Laacke 1979). This series is described as having soils of sandy loams which dry out by mid-summer. The stable parent material allows development of moderately deep to shallow soils on steep slopes of 50-75%. The associated Chiquito series

has soils which are shallower. They are typical of upper slopes and ridges. The soils are coarse, sandy loams to gravelly, coarse, sandy loams in texture. The association of Chawanakee soils with Rockland is extensive in the region and covers part of the study area.

Topography below the lake and meadows on the east boundary of the RNA is one of long, steep slopes dissected by creeks. These creeks lack terraces and have little development of riparian borders. The slopes throughout the study area are less extreme than mapped in the Red Cap Creek by Rocky et al. (1966). The glacial drift may well have resulted in the development of deeper, though more heterogeneous soils here. The high elevation soils under white fir described by Alexander (n.d.) for the Siskiyou Mountains are descriptive of the study area. They are shallow to moderately deep soils of siliceous granite rock terrain and soils of glacial drift. These soils differ from Chawanakee series in being of the coarse-loamy, mixed, frigid family of the Typic Xerumbrepts.

The vegetation of the study area is predominantly forest. A large patch of montane chaparral, the Quercus vaccinifolia/Arctostaphylos patula type (Sawyer and Thornburgh 1977), is included as is a collection of seasonally wet to dry meadows at Red Cap Hole. Forests of most of the area would be classified by Sawyer and Thornburgh (1977) as belonging to the Abies concolor series. Regionally the Abies concolor/Trillium ovatum type is typical of terraces and moist,

lower slopes. Floristically, the ground and shrub layers are extensive and diverse. The mesic, low to mid-slopes support the Abies concolor/Vicia americana type. This type especially has a less developed shrub layer. The ground layer is similar to the Abies concolor/Trillium ovatum type, but less extensive. The dry upper slopes and ridges support the Abies concolor/Chimaphila umbellata type, with its floristically depauperate ground layer. The forests of the higher elevations of North Trinity Mountain where noble fir becomes dominant would be included in the Abies magnifica series.

The climate of the study area is suggested by reviewing data from Weitchpec, Hoopa and Salyer stations (Rocky et al. 1966). Weitchpec is the most maritime station being located at the confluence of the Trinity and Klamath Rivers (Table 1). Hoopa is directly west of North Trinity Mountain, but some 5500 ft. lower in elevation. Salyer is the most easterly and most continental of the three stations and temperatures are lower accordingly. The study area is in the major snow belt elevation, with patches of snow lasting into July on north facing slopes at the highest elevations. Mean annual temperature of 56° F and a normal precipitation of 25-40 inches/year is proposed for the Chawanakee series (Laacke 1979). Rocky et al. (1966) suggest a mean annual temperature of about 50° F, and precipitation of 60-70 inches/year for this series in the North Coast Region. The study area probably experiences even lower mean annual temperatures and higher normal precipitation.

METHODS

Vascular plants were inventoried in summer of 1979 during a preliminary reconnaissance of the area. Only specimens of unknown taxa were collected. Voucher specimens are deposited at the Humboldt State University Herbarium (HSC). Reconnaissance suggested major types of white fir forest and montane chaparral. The meadows in Red Cap Hole were included in the floristic considerations, but were not sampled vegetationally. Sampling was done in summers of 1979 and 1980. Floristic composition of forests and montane chaparral were sampled using 21 relevés. The forest was also sampled with 10, one-tenth acre strips to assess tree density, basal area and frequency. Tree diameters were estimated. Ten trees were cored to determine age. Heights were measured to evaluate site productivity.

RESULTS

Some 221 taxa were recognized in the proposed RNA (Appendix I). Most are typical of montane forest of the Abies concolor series in the Klamath Region. Gentiana setigera Gray, which occurs in the Red Cap Hole meadows, is listed by CNPS (Smith et al. 1980) as rare in California, common elsewhere.

Stand composition of canopy trees (Table 2) is dominated by white fir. Some 89% of the stand density (163 trees/acre) is attributed to white fir. Stand basal area (513 sq. ft./acre) is slightly less influenced by white fir which commands 73%. The few, large sugar pine contribute relatively high

basal area for their density. Plots were taken at mid-elevations in the study area, this accounts for the low density of noble fir. Trees older than 100 years were about 120 ft. in height (Fig. 2). Variation in height-age relationship may be in part due to site as two forest types are recognized, but suppression of tolerant white fir may also be involved.

The 21 releves were compiled to form association tables which suggest two rather distinct forest types (Table 3) here named Abies concolor/Pteridium aquilinum (ABCO/PTAQ) and Abies concolor/Quercus sadleriana (ABCO/QUSA). The montane chaparral type was named Abies concolor/Quercus vaccinifolia (ABCO/QJVA).

Abies concolor/Pteridium aquilinum is an extensive, closed forest whose canopy and understory are dominated by white fir. The shrub layer is not well developed, though it contains some mesic taxa. Acer glabrum, Rubus parvifolium and Symphoricarpos hesperius are frequent. Some 25 herb taxa are restricted to this type, and 8 more are more common here than in other types. The ground layer is similar in type to Abies concolor/Trillium ovatum, but ABCO/PTAQ has a less extensive layer of mesophytic shrubs. Linnaea borealis, frequently encountered in ABCO/PTAQ, is suggestive of mesic types in the higher elevation Abies magnifica series (Table 3).

The second forest type, Abies concolor/Quercus sadleriana, also has the canopy and understory dominated by white fir.

However, Douglas-fir is also an important component. The type is more extensive on steeper slopes of lower elevations in the study area. This may account for the high values for Douglas-fir. The shrub layer is dominated by Quercus sadleriana and the ground layer has few herbs. This type is similar to Abies concolor/Mahonia nervosa of the eastern Klamath Region (Sawyer and Thornburgh 1977). Steep slopes contribute to lower canopy coverage and resulting shrub layer development of Quercus sadleriana (Table 3).

The montane chaparral type, Abies concolor/Quercus vaccinifolia, is dominated by Arctostaphylos patula and Quercus garryana var. breweri. White fir and incense cedar are frequent along with common Klamath Region montane sclerophylls (Table 3).

Native animal use in the area is light, deer probably the most common. Cattle use the area. The meadows of Red Cap Hole are grazed, as is the ground layer in Abies concolor/Pteridium aquilinum stands. However, this use may only be trespass from an allotment on meadows east and south of North Trinity Mountain.

EVALUATION OF THE AREA

The area is typical of western Klamath Region montane forest. It is an excellent area for a RNA especially the boundaries proposed by Ward and Horton (1978) to include the west side of North Trinity Mountain. I would include Red Cap Hole and the west slopes at lower elevations which are not in the Colgrove Timber Sale unit. This gives the

RNA good white fir types with transitions to high elevations containing noble fir, as well as to lower elevations containing Douglas-fir. The montane chaparral adds to the area's appeal for research.

The only nonconforming uses are trespass grazing and some logging just east of F.S. road 10N02.

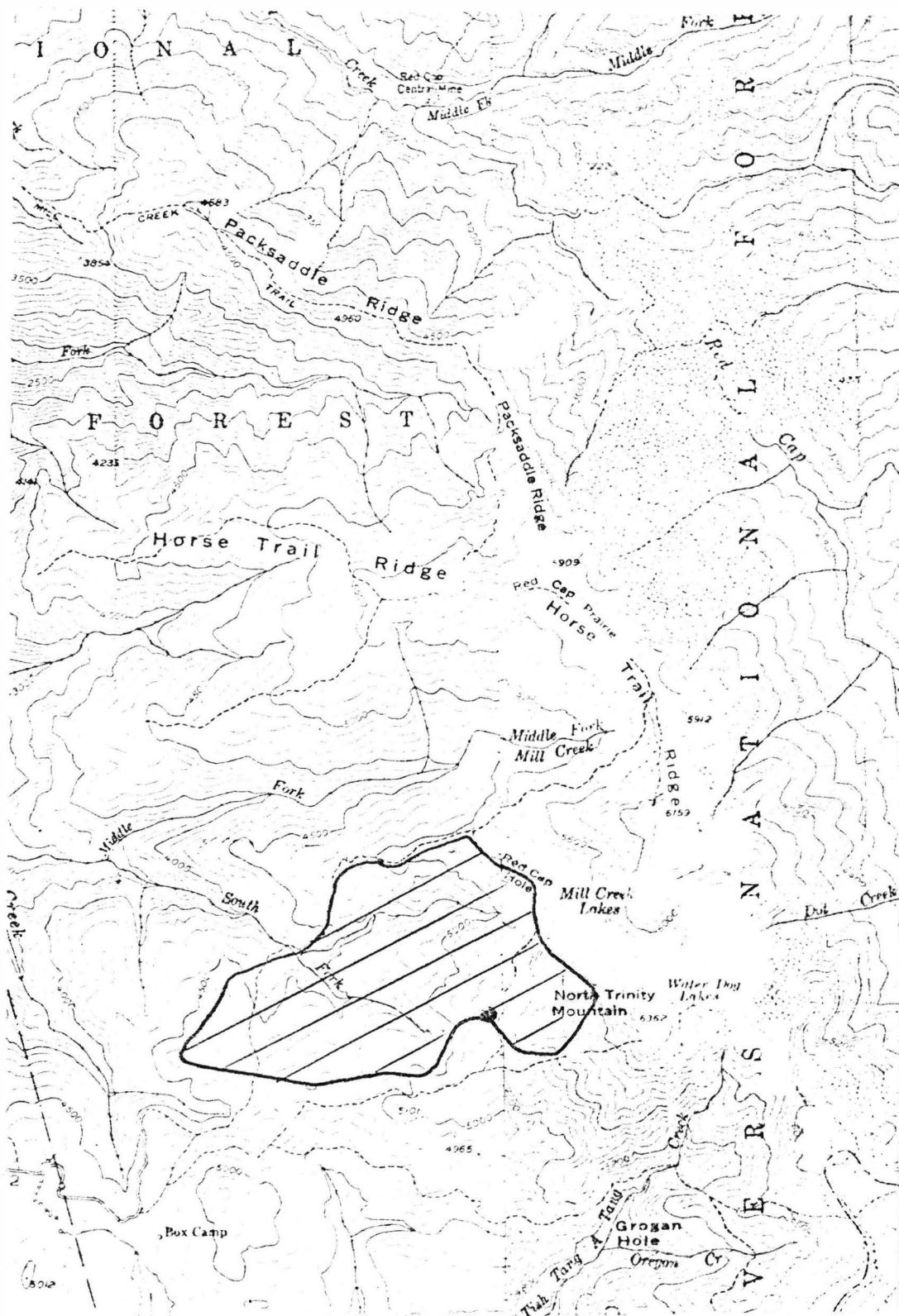
The proposed RNA area already receives research and educational use from Humboldt State University Forestry and Biology Departments. It is the most accessible montane forest area to the university. The study area has also been used by the Pacific Northwest Forest and Range Experimental Station in studies of true fir. I strongly recommend classification as a Research Natural Area.

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This topographic map depicts a section of the National Forest. Key features include:

- Ridges:** Packsaddle Ridge and Horse Trail Ridge are prominent, with contour lines indicating elevations such as 4233, 4360, 4500, 4600, 4700, 4800, 4900, 5000, 5100, 5200, 5300, 5400, 5500, 5600, 5700, 5800, 5900, 6000, 6100, 6200, 6300, 6400, 6500, 6600, 6700, 6800, 6900, 7000, 7100, 7200, 7300, 7400, 7500, 7600, 7700, 7800, 7900, 8000, 8100, 8200, 8300, 8400, 8500, 8600, 8700, 8800, 8900, 9000, 9100, 9200, 9300, 9400, 9500, 9600, 9700, 9800, 9900, 10000.
- Trails:** The Red Cap Trail and Horse Trail are marked with dashed lines.
- Water Features:** Middle Fork Creek, South Fork, and Mill Creek are shown. Mill Creek Lakes and Water Dog Lakes are also labeled.
- Mountains:** North Trinity Mountain is a notable peak.
- Other Landmarks:** Box Camp, Grogan Hole, and Oregon Cr are identified.
- Boundaries:** The National Forest boundary is indicated by a dashed line.



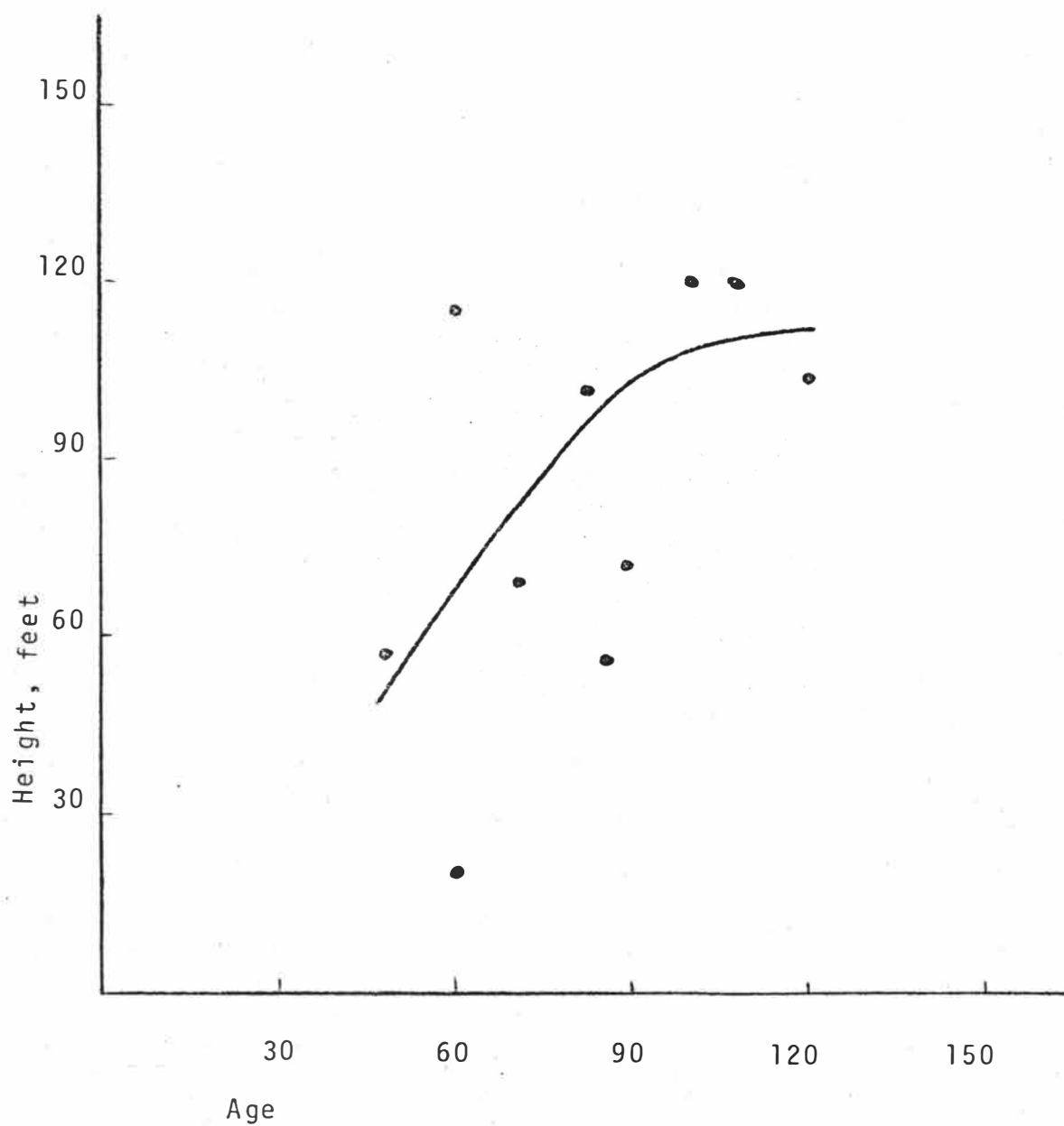


Figure 2. Height-age relations among ten trees of white fir, proposed North Trinity Mtn. RNA.



Figure 3. General view of white fir forests of the proposed RNA.



Figure 4. Meadow of Red Cap Hole. Veratrum californicum.



Figure 5. Mill Creek Lake.

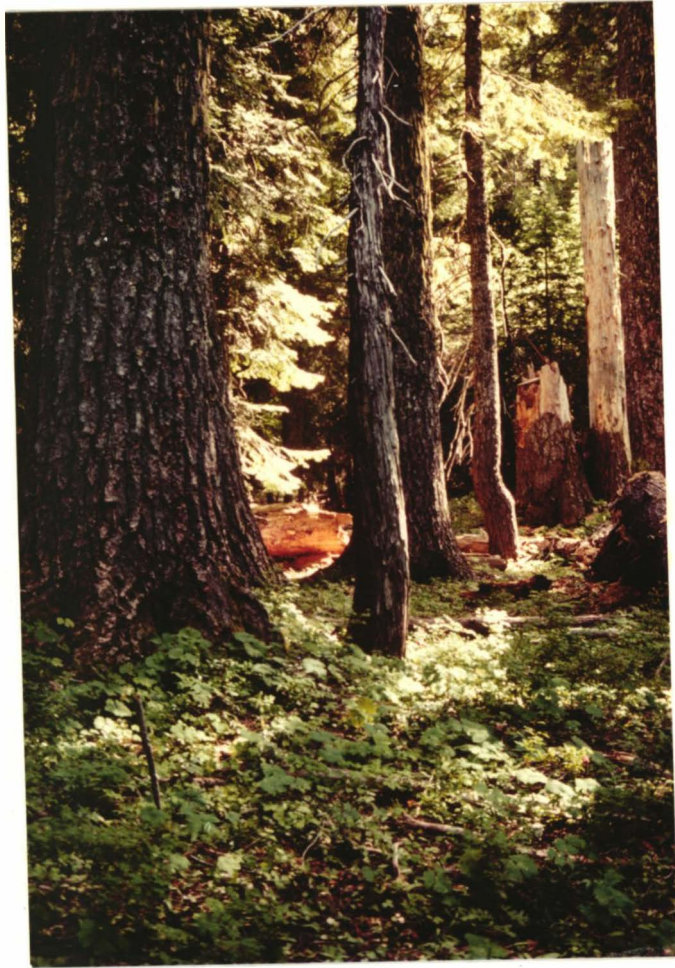


Figure 6. General structure of the Abies concolor/Pteridium aquilinum type.



Figure 7. General structure of the Abies concolor/Quercus sadleriana type.

Table 1. Climatic data for nearby stations to North Trinity Mountain Research Natural Area. From R. E. Rocky, K. E. Bradshaw and A. G. Shrell. 1966. Interm Report, Soil-Vegetation Survey, Orleans Ranger District, Six Rivers National Forest.

	Weitchpec	Hoopa	Salyer
County	Humboldt	Humboldt	Trinity
Elevation	1700 ft.	359 ft.	623 ft.
Temperature			
Highest	102 ^o F	110 ^o F	111 ^o F
Mean maximum			
July	83.5	93.4	94.9
January	45.0	52.0	71.2
Year	64.5	70.0	50.7
Mean temperature			
July	67.6	73.3	72.7
January	38.0	43.7	57.0
Year	52.4	56.9	42.2
Mean minimum			
July	51.7	53.1	54.3
January	30.9	43.8	42.7
Year	40.2	35.4	33.6
Lowest	16.0	12.0	20.0
Precipitation			
July	.57 in.	.08 in.	.13 in.
August	.06	.38	.20
September	2.12	.98	.68
October	3.76	4.47	3.22
November	12.78	6.75	5.79
December	11.30	9.84	9.05
January	16.30	11.66	9.46
February	10.47	9.17	8.22
March	5.77	7.48	6.15
April	5.04	3.20	2.76
May	3.79	2.39	2.22
June	1.04	.85	.82
Season	73.38	57.25	48.70
Average snowfall			
Season	51.5 in.	0.4 in.	3.2 in.
Dry date ^a .	July 16	June 30	June 27

a. The date when stored soil moisture has been depleted in a typical year.

Table 2. Stand composition of canopy (<4" dbh) trees for the forests. D=density, trees/acre; BA=basal area, square feet/acre; F=frequency, percent.

Taxa	D	BA	F
<u>Abies concolor</u>	145	372	100
<u>Calocedrus decurrens</u>	9	67	50
<u>Abies procera</u>	6	50	30
<u>Pinus lambertiana</u>	2	23	10
<u>Pseudotsuga menziesii</u>	1	1	10
Stand	163	513	

Table 3. Modal cover/abundance (C/A) and presence (P%) for all sampled trees, and for shrubs and herbs with at least 15% presence. Data from 21 relevés. Cover/abundance scale: 1= one individual, 2= sparse and less than 10%, 3= common and less than 10%, 4= 10-25%, 5= 25-50%, 6= 50-75%, 7= more than 75%. Applicable subspecific nomenclature in Appendix I. ABCO/PTAQ= Abies concolor/Pteridium aquilinum, ABCO/QUSA= Abies concolor/Quercus sadleriana, ABCO/QUVA= Abies concolor/Quercus vaccinifolia types.

Taxa	ABCO/PTAQ C/A·P%	ABCO/QUSA C/A·P%	ABCO/QUVA C/A·P%
Trees			
<u>Abies concolor</u>	5.100	5.100	
<u>Pseudotsuga menziesii</u>	3.90	4.85	
<u>Abies procera</u>	3.50	2.50	
<u>Pinus lambertiana</u>	2.40	2.35	
<u>Calocedrus decurrens</u>	4.30	1.15	
Understory trees			
<u>Abies concolor</u>	4.100	4.100	3.100
<u>Pseudotsuga menziesii</u>	3.50	4.50	3.20
<u>Abies procera</u>	2.30	2.65	—
<u>Calocedrus decurrens</u>	2.50		3.80
<u>Taxus brevifolia</u>	2.20		
Shrubs			
<u>Acer glabrum</u>	2.20		
<u>Rubus parvifolium</u>	2.50	1.30	
<u>Symphoricarpos hesperius</u>	3.60	2.15	
<u>Mahonia nervosa</u>	3.60	3.35	
<u>Rosa gymnocarpa</u>	3.100	2.100	
<u>Vaccinium membranacium</u>	3.20	3.35	
<u>Ribes lobbii</u>	2.20	2.15	
<u>Paxistima myrsinites</u>	2.20	3.15	
<u>Corylus cornuta</u>	2.20	2.15	
<u>Quercus sadleriana</u>	3.70	5.85	2.40
<u>Arctostaphylos patula</u>			6.80
<u>Quercus garryana</u>			5.80
<u>Ceanothus velutinus</u>	2.10		3.60
<u>Quercus vaccinifolia</u>			3.60
<u>Amelanchier alnifolia</u>			3.60
<u>Prunus emarginata</u>	2.10		3.40
<u>Arctostaphylos nevadensis</u>			2.40
<u>Holodiscus discolor</u>			2.40

Taxa	ABCO/PTAQ C/A.P%	ABCO/QUSA C/A.P%	ABCO/QUVA C/A.P%
Herbs			
<u>Pteridium aquilinum</u>	3.70		
<u>Trillium ovatum</u>	2.70		
<u>Linnaea borealis</u>	5.60		
<u>Glyceria elata</u>	2.60		
<u>Iris tenuissima</u>	2.60		
<u>Viola glabella</u>	2.60		
<u>Smilacina stellata</u>	3.60		
<u>Adenocaulon bicolor</u>	2.50		
<u>Fragaria vesca</u>	2.50		
<u>Corallorhiza mertensiana</u>	2.50		
<u>Campanula scouleri</u>	2.40		
<u>Hieracium albiflorum</u>	2.40		
<u>Ribes lacustre</u>	2.40		
<u>Penstemon anguineus</u>	2.40		
<u>Lathyrus nevadensis</u>	3.30		
<u>Disporum hookeri</u>	2.30		
<u>Circaea alpina</u>	2.30		
<u>Lilium washingtonianum</u>	1.30		
<u>Phlox adsurgens</u>	3.20		
<u>Aquilegia formosa</u>	2.20		
<u>Festuca occidentalis</u>	2.20		
<u>Tiarella trifoliata</u>	2.20		
<u>Osmorhiza chilensis</u>	2.20		
<u>Ribes viscosissimum</u>	2.20		
<u>Epilobium angustifolium</u>	2.20		
<u>Anemone deltoidea</u>	4.90	3.15	
<u>Achlys triphylla</u>	4.90	3.15	
<u>Galium trifolium</u>	2.80	2.15	
<u>Vancouveria hexandra</u>	3.80	3.15	
<u>Rubus vitifolius</u>	3.80	2.15	
<u>Clintonia uniflora</u>	3.70	3.15	
<u>Moehringia macrophylla</u>	3.50	3.15	
<u>Vicia americana</u>	2.30	2.15	
<u>Chimaphila umbellatum</u>	4.70	4.100	
<u>Chimaphila menziesii</u>	3.60	2.65	
<u>Orthilia secunda</u>	2.40	3.65	
<u>Goodyera oblongifolia</u>	2.70	2.65	
<u>Streptopus amplexifolius</u>	3.20	3.15	
<u>Corallorhiza maculata</u>	2.40	2.35	
<u>Arnica discoidea</u>	2.20	3.15	
<u>Microsteris gracilis</u>	2.20	2.35	
<u>Pedicularis racemosa</u>	3.30	2.15	
<u>Pyrola picta</u>	2.40	3.85	
<u>Apocynum androsaemifolium</u>	2.40	2.65	2.40
<u>Lotus crassifolius</u>		2.35	

Appendix I. Taxa recognized within the proposed North Trinity Mountain Research Natural Area. Collected plants were identified using the facilities of the Humboldt State University Herbarium (HSC). Vouchers are deposited there. Nomenclature follows J.P. Smith and J.O. Sawyer. 1981. Keys to the families and genera of vascular plants in northwest California. Mad River Press, Arcata, CA; and J.T. Kartesz and R. Kartesz. 1980. A synonymized checklist of the vascular flora of the United States, Canada and Greenland. University of North Carolina, Chapel Hill.

ACERACEAE

Acer circinatum
Acer glabrum var. torreyi

APOCYNACEAE

Apocynum androsaemifolium var. pumilum

ARISTOLOCHIACEAE

Asarum caudatum
Asarum hartwegii

ASPIDIACEAE

Athyrium filix-femina var. cyclosorum
Polystichum imbricans
Polystichum munitum

BETULACEAE

Alnus viridis ssp. sinuata
Alnus incana ssp. tenuifolia
Corylus cornuta var. californicum

BORAGINACEAE

Hackelia micrantha
Plagiobotrys hispidulus

CAMPANULACEAE

Campanula prenanthoides
Campanula scouleri

CAPRIFOLIACEAE

Linnaea borealis ssp. longiflora
Lonicera conjugialis
Sambucus racemosa var. callicarpa
Symphoricarpos hesperius

CARYOPHYLLACEAE

Cerastium arvense
Moehringia macrophylla
Spergularia rubra
Stellaria jamesiana
Stellaria media

CELASTRACEAE

Paxistima myrsinites
Euonymus occidentalis var. occidentalis

COMPOSITAE

Achillea millefolium ssp. lanulosa
Adenocaulon bicolor
Agoseris heterophylla
Arnica cordifolia
Arnica discoidea
Artemisia douglasiana
Hieracium albiflorum
Hieracium horridum
Rudbeckia californica
Senecio integerrimus
Senecio triangularis
Solidago californica

CORNACEAE

Cornus sericea ssp. sericea

CRUCIFERAE

Arabis holboellii var. retrofracta
Arabis sparsifolia var. subvillosa
Cardamine californica
Erysimum capitatum

CUPRESSACEAE

Calocedrus decurrens

CYPERACEAE

Carex bolanderi

ERICACEAE

Arbutus menziesii
Arctostaphylos columbiana
Arctostaphylos nevadensis
Arctostaphylos patula
Gaultheria ovatifolia
Vaccinium membranaceum
Vaccinium uliginosum ssp. occidentale

FAGACEAE

Chrysolepis chrysophylla
Chrysolepis sempervirens
Quercus chrysolepis
Quercus garryana var. breweri
Quercus sadleriana
Quercus vaccinifolia

FUMARIACEAE

Dicentra pauciflora

GARRYACEAE

Garrya fremontii

GENTIANACEAE

Frasera speciosa
Gentiana setigera

GRAMINEAE

Bromus marginatus
Danthonia unispicata
Deschampsia danthonoides
Deschampsia elongata
Festuca idahoensis
Festuca occidentalis
Glyceria elata
Hordeum brachyantherum
Melica bulbosa
Melica geyeri
Melica subulata
Phleum alpinum
Phleum pratense
Poa canbyi
Poa compressa
Poa pratensis

GROSSULARIACEAE

Ribes bracteosum
Ribes binonimatum
Ribes lacustre
Ribes lobbi
Ribes marshallii
Ribes sanguineum var. sanguineum
Ribes viscosissimum var. hallii

HYDRANGEACEAE

Whipplea modesta

HYDROPHYLLACEAE

Hydrophyllum fendleri var. albifronsHydrophyllum tenuipesNemophila parvifloraPhacelia mutabilisPhacelia procera

HYPERICACEAE

Hypericum anagalloidesHypericum perforatum

IRIDACEAE

Iris tenuissima

JUNCACEAE

Juncus mertensianusLuzula multiflora ssp. comosa

LABIATAE

Agastache urticifoliaMonardella odoratissima ssp. pallidaPrunella vulgaris var. elongataStachys rigida

LEGUMINOSAE

Lathyrus nevadensisLathyrus pauciflorusLathyrus polyphyllusLotus crassifoliusLupinus latifoliusTrifolium cyantheferumTrifolium longipesTrifolium pratenseVicia americana

LILIACEAE

Calochortus tolmieiClintonia unifloraDisporum hookeri var. trachyandrumLilium pardalinumLilium washingtonianumSmilacina racemosa var. amplexicaulisSmilacina stellataStreptopus amplexifolius var. americanusTrillium ovatumVeratrum californicum

MALVACEAE

Sidalcea oregana ssp. spicata

ONAGRACEAE

Circaea alpina ssp. pacificaEpilobium angustifoliumEpilobium minutumEpilobium oregonenseGayophytum diffusum ssp. parviflorum

ORCHIDACEAE

Cephalanthera austiniaeCorallorhiza maculataCorallorhiza mertensianaGoodyera oblongifoliaListera caurinaListera convallarioidesPlatanthera dilatataPlatanthera sparsiflora

OXALIDACEAE

Oxalis oreganaOxalis trilliifolia

PINACEAE

Abies concolorAbies proceraPinus lambertianaPinus ponderosaPseudotsuga menziesii

PODOPHYLLACEAE

Achyls triphyllaVancouveria hexandra

POLEMONIACEAE

Gilia capitataLinanthus ciliatusMicrosteris gracilisPhlox adsurgensPhlox diffusa

POLYGONACEAE

Eriogonum nudum
Eriogonum umbellatum
Polygonum bistortioides
Polygonum minutum
Polygonum parryi
Rumex acetosella
Rumex californicus

PORTULACACEAE

Calyptroidium umbellatum
Claytonia cordifolia
Claytonia parviflora
Claytonia sibirica
Lewisia triphylla

PTERIDACEAE

Pteridium aquilinum var. pubescens

PYROLACEAE

Chimaphila menziesii
Chimaphila umbellata var. occidentalis
Orthilia secunda
Pyrola picta

RANUNCULACEAE

Actaea rubra ssp. arguta
Aconitum columbianum
Anemone deltoidea
Anemone oregana var. oregana
Aquilegia formosa var. formosa
Delphinium depauperatum
Delphinium glaucum
Delphinium nuttallianum
Ranunculus alsimaeifolius var. hartwegii
Ranunculus uncinatus
Trautvetteria caroliniensis var. occidentalis

RHAMNACEAE

Ceanothus velutinus
Rhamnus californica

ROSACEAE

Amelanchier alnifolia
Fragaria vesca ssp. californica
Holodiscus discolor
Potentilla glandulosa ssp. nevadensis
Potentilla gracilis ssp. glabrata
Prunus emarginata
Rosa gymnocarpa
Rubus parviflorus
Rubus vitifolius

RUBIACEAE

Galium aparine
Galium bifolium
Galium triflorum

SALICACEAE

Salix scouleriana
Salix sitchensis

SAXIFRAGACEAE

Boykinia elata
Boykinia major
Lithophragma heterophylla
Mitella breweri
Mitella trifida
Tellima grandiflora
Tiarella trifoliata var. unifoliata
Tolmeia menziesii

SCROPHULARIACEAE

Castilleja applegatei
Castilleja miniata
Collinsia grandiflora
Mimulus breweri
Mimulus guttatus
Mimulus moschatus
Mimulus primuloides var. primuloides

Orthocarpus copelandii
Pedicularis racemosa
Penstemon anguineus
Tonella tenella
Veronica americana
Veronica cusickii

TAXACEAE

Taxus brevifolia

UMBELLIFERAE

Angelica tomentosa var. tomentosa
Heracleum sphondylium ssp. montanum
Ligusticum californicum
Osmorhiza chilensis
Osmorhiza occidentalis
Sanicula crassicaulis

VIOLACEAE

Viola glabella
Viola lanceolata